# Fisher® Z500 Severe Service Ball Valves

## Contents

Introduction ..... 1
Scope of Manual ..... 1
Description ..... 1
Specifications ..... 1
Installation ..... 5
Operation ..... 7
Maintenance ..... 8
Troubleshooting ..... 9
Packing Replacement ..... 10
Actuator Mounting ..... 13
Parts Ordering ..... 18
Parts List ..... 18

Figure 1. Fisher Z500 Severe Service Ball Valve

X1200

# Introduction

## Scope of Manual

This instruction manual provides installation, operation, maintenance, and parts information for the Fisher Z500 Severe Service Ball Valve (see figure 1).

Do not install, operate, or maintain Z500 valves without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. **To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings.** If you have any questions about these instructions, contact your Emerson Process Management sales office before proceeding.

## Description

The Z500 severe service ball valve is a split body bolted design, full or reduced port, with a blowout proof stem. It can be lever operated, gear operated, or actuated. The Z500 severe service ball valve line is a simplistic two-piece floating ball design with integral metal seat meant to provide tight metal seating shutoff in high temperature, high pressure, corrosive, and erosive applications across all industries.

## Specifications

Specifications for these valves are shown in table 1.

Table 1. Specifications

**Valve Sizes**

Z500: NPS ■ 1/2, ■ 3/4, ■ 1, ■ 1-1/2, ■ 2, ■ 3, ■ 4, ■ 6, ■ 8, ■ 10, ■ 12, ■ 14, ■ 16, ■ 18, ■ 20, ■ 24, ■ 26, ■ 28, ■ 30 and, ■ 36

**Maximum Working Pressures(1)**

Forged Steel Valves: Consistent with applicable pressure-temperature ratings in table 2 per ASME B16.34, but do not exceed the material temperature capabilities shown below.

**Shutoff Classification(1)**

Z500: Valves are tested to API 598 in the preferred flow direction.

Class V type B per FCI 70-2 in reverse flow in bi-directional design (Must be specified). For other shutoff requirements, please contact your Emerson Process Management sales office

**Construction Materials**

See table 3

**Temperature Capabilities(1)**

Welded and Threaded Ends: SA105 - 800°F, F22 1000°F, F91 1200°F, F316 1400°F

Flanged End Connections: SA105 - 600°F, F22 800°F, F91 1000°F, F316 1000°F

**Packing Constructions**

Carbon Steel Valve Bodies: Wire reinforced graphite stem packing, AISI 4130 nitrided packing gland

Stainless Steel: Wire reinforced graphite stem packing, 316 SST nitrided packing gland

**Dimensions**

Contact your Emerson Process Management sales office

**Standard Flow Direction**

Preferred Flow Direction: Preferred flow for optimal sealing is forward into the integral seat

**Flow Coefficients**

Contact your Emerson Process Management sales office

**Maximum Ball Rotation**

90 degrees

**Actuator Mounting**

The preferred mounting orientation is vertical. Other orientations are acceptable

**Approximate Weight**

Contact your Emerson Process Management sales office

**Options**

■ Reduced port, ■ Double reduced ports, ■ Expanded outlet, ■ Scraper seats, ■ HVOF coating options, ■ Bi-directional sealing, ■ High cycle constructions, ■ Lockouts, ■ Spray and fused coatings

1. The pressure/temperature limits in this bulletin, and any applicable code or standard limitation, should not be exceeded.

Table 2. Valve Body Materials, End Connections, and Ratings

| Ratings | Bore | Size, NPS | End Connection | Valve Body Materials |
|---|---|---|---|---|
| CL150 through 1500 | 0.65 | 1/2 | Buttweld, Socketweld, FNPT, RF, RTJ | SA105, F22, F91, and F316 |
| | | 3/4 | | |
| | | 1 | | |
| | | 1-1/2 | | |
| | 1.15 | 1 | | |
| | | 1-1/2 | | |
| | | 2 | | |
| | | 2-1/2 | | |
| | 1.5 | 1-1/2 | | |
| | | 2 | | |
| | | 2-1/2 | | |
| | | 3 | Buttweld, RF, RTJ | |
| | 2 | 2 | Buttweld, Socketweld, FNPT, RF, RTJ | |
| | | 2-1/2 | | |
| | | 3 | Buttweld, RF, RTJ | |
| | | 4 | | |
| | 3 | 3 | RF, RTJ | |
| | | 4 | | |
| | | 6 | | |
| | 4 | 4 | | |
| | | 6 | | |
| | 6 | 6 | | |
| | | 8 | | |
| | 8 | 8 | | |
| | | 10 | | |
| | 10 | 10 | | |
| | 12 | 12 | | |
| | 14 | 14 | | |
| | 16 | 16 | | |
| | 18 | 18 | | |
| | 20 | 20 | | |
| | 24 | 24 | | |
| | 26 | 26 | | |
| | 28 | 28 | | |
| | 30 | 30 | | |
| | 36 | 36 | | |

-continued-

Table 2. Valve Body Materials, End Connections, and Ratings (continued)

| Ratings | Bore | Size, NPS | End Connection | Valve Body Materials |
|---|---|---|---|---|
| CL2500 | 0.65 | 1/2 | Buttweld, Socketweld, FNPT, RF, RTJ | SA105, F22, F91, and F316 |
| | | 3/4 | | |
| | | 1 | | |
| | | 1-1/2 | | |
| | 1.15 | 1 | | |
| | | 1-1/2 | | |
| | | 2 | | |
| | | 2-1/2 | | |
| | 1.5 | 1-1/2 | | |
| | | 2 | | |
| | | 2-1/2 | | |
| | | 3 | Buttweld, RF, RTJ | |
| | 2 | 2 | Buttweld, Socketweld, FNPT, RF, RTJ | |
| | | 2-1/2 | | |
| | | 3 | Buttweld, RF, RTJ | |
| | | 4 | | |
| | 3 | 3 | RF, RTJ | |
| | | 4 | | |
| | | 6 | | |
| | 4 | 4 | | |
| | | 6 | | |
| | 6 | 6 | | |
| | | 8 | | |
| | 8 | 8 | | |
| | | 10 | | |
| CL3200 and CL4500 | 0.65 | 1/2 | Buttweld, Socketweld | F22, F91, and F316 |
| | | 3/4 | | |
| | | 1 | | |
| | | 1-1/2(1) | | |
| | 1.15 | 1 | | |
| | | 1-1/2 | | |
| | | 2 | | |
| | | 2-1/2 | | |
| | 1.5 | 1-1/2 | | |
| | | 2 | | |
| | | 2-1/2 | | |
| | | 3 | Buttweld | |

1. Not available in CL4500.

Table 3. Standard Construction Materials for NPS 1/2 through 36 Valves

| PART | MATERIAL |
|---|---|
| Balls | F22, 316, F91, and 410 |
| Bodies | F22, SA105, F91, and F316 |
| Upstream seats | 410/F6A, F22, 316, and F91 |
| Body gaskets | S17400, N07718, S66286 |
| Springs | S17400, N07718, S66286 |
| End adapter | F22, SA105, F91, and F316 |
| Coatings | HVOF chromium carbide |
| Packing | Flexible graphite with S41000 stainless anti-extrusion rings |
| Shafts (stem) | S17400 nitrided, N07718 nitrided, S66286 nitrided (QPQ - quench polish quench) |
| Key | Zinc plated carbon steel |
| Stem adapter | AISI 4130, 4140 |
| Seat Holder | 410/F6A, F22, F316, and F91 |

# Installation

## ⚠ WARNING

**Always wear protective gloves, clothing, and eyewear when performing any installation operations to avoid personal injury.**

**Personal injury or equipment damage caused by sudden release of pressure may result if the valve assembly is installed where service conditions could exceed either the valve body rating or the mating pipe flange joint rating. To avoid such injury or damage, provide a relief valve for overpressure protection as required by government or accepted industry codes and good engineering practices.**

**Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

**If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.**

## ⚠ WARNING

**When ordered, the valve configuration and construction materials were selected to meet particular pressure, temperature, pressure drop, and controlled fluid conditions. Responsibility for the safety of process media and compatibility of valve materials with process media rests solely with the purchaser and end-user. To avoid possible personal injury and because some valve/trim material combinations are limited in their pressure drop and temperature ranges, do not apply any other conditions to the valve without first contacting your Emerson Process Management sales office.**

## ⚠ WARNING

**The valve drive shaft is not necessarily grounded to the pipeline when installed. Personal injury or property damage could result from an explosion caused by a discharge of static electricity from valve components if the process fluid or the atmosphere around the valve is flammable. If the atmosphere around the valve or the process fluid is flammable, electrically bond the drive shaft to the valve.**

## ⚠ WARNING

**Personal injury could result from packing leakage. Valve packing was tightened before shipment; however the packing might require some readjustment to meet specific service conditions. Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

When a valve is shipped bare stem:

a. Valve is shipped in the open position with exposed stem

b. Valve will include two stem keys.

When a valve is shipped with mounting kit only:

a. Valve will ship in the in open position

b. Valve will have the mounting finger-tight to the valve

c. Customer shall ensure proper mounting of the actuator

d. Customer shall ensure valve stem has not been pushed or forced down into the valve

e. Customer shall ensure no binding occurs when mounting the actuator
   i. Customer shall ensure the correct alignment is done when mounting the actuator
   ii. No hammering or forcing down of the stem adapter is allowed

f. Customer shall ensure all bolts are torqued down appropriately

g. Customer shall ensure the actuator mounting surface is completely flush with the mounting bracket. For additional information on actuator mounting, refer to the Actuator Mounting section in this instruction manual on page 13.

h. Customer shall ensure the mounting can allow for or can accommodate expansion of the stem or adapter at high temperatures. See table 6.

When a valve is shipped with actuator:

a. Valve will be shipped in the required fail position

b. All bolting will be torqued as required

c. Emerson recommends that the customer not remove the actuator for final installation in the line

1. Inspect the valve prior to installation into the piping system to ensure there is no shipping damage. End protectors and shipping materials must be removed to allow a complete inspection.
2. Inspect the actuator, if included, for damage and then cycle the valve with the actuator from open (the normal shipping position) to closed to open to ensure proper functioning.

**CAUTION**

**Make sure the valve is installed in the correct orientation. Put the high pressure side (body side) on the upstream side. The arrow on the valve should point from the high pressure to low pressure side when the valve is closed. The valve could be damaged if installed incorrectly.**

# Weld End Valves

**⚠ WARNING**

**Emerson Process Management is not responsible for improper installation or inspection of any valve which falls outside the criteria presented in this instruction manual. Requests for additional information on unique situations should be directed to your Emerson Process Management sales office.**

**CAUTION**

**Weld fill between the valve and pipe should never be used to correct for improper pipe installation length or misalignment. Additional welding beyond what is required may cause the valve to reach higher temperatures and have a larger heat-affected zone, which can cause permanent damage to the valve or its components.**

For additional information, refer to ASME Boiler and Pressure Vessel Code Section IX.

## Procedure

### Initial Preparation

1. Ensure the valve is in the fully open position so that vital sealing areas of the ball are not exposed to weld spatter.
2. Never make arc strikes on the valve body or end adapter except inside the groove intended for butt welding or inside the corner of the joint for socket welding. Arc strikes made on areas which are not intended to be welded can cause a localized increase in hardness and micro-cracks, and can otherwise compromise the intended mechanical properties of the material.
3. Attach the welding ground strap to the side of the valve being welded.
4. Install the valve into the piping system prior to welding in order to minimize piping loads. Orient the valve with the stem vertical, if possible, and install the piping such that pipe loads are minimized on the valve.
5. Weld the valve into the line using welders and procedures fully qualified per ASME Boiler and Pressure Vessel Code Section IX.
6. Ensure that the valve body temperature always remains below 427°C (800°F).

### Post-Weld Heat Treatment

**CAUTION**

**Depending on valve body materials used, post weld heat treating may be required. If so, damage to internal parts is possible. Do not place the entire valve in a stress relief furnace, or cover the entire valve with stress relieving blankets, as this could damage the valve. Contact your Emerson Process Management sales office for additional information.**

1. Weld the valve into the line using qualified welders and procedures per Section IX of the ASME Boiler and Pressure Vessel Code. If specific procedures are required, contact your Emerson Process Management sales office for written guidance based on pipe and valve materials.
2. Apply post weld heat treat in accordance with valve material and code requirements. Only local post weld heat treat on each end of the valve must be used.

### Final Inspection after Post-Weld Heat Treatment

After post weld heat treat, verify valve body studs and packing studs are tight.

**CAUTION**

**Before cycling the valve in the line, make sure the line is clean of weld slag and other debris that could damage the valve. Cycle the valve after installation to ensure proper functioning.**

1. Cycle the valve to verify proper operation. Ensure that the torque required to cycle the valve has remained within acceptable limits.
2. Verify that the body and packing bolting are tightened to the correct torque per tables 4 and 5.
3. Install proper insulation as required for insulated piping systems.

# Operation

1. No routine maintenance or lubrication is required. No tightening of body studs should be necessary. Packing bolting may be retightened if a stem packing leak is noted during operation.

2. Actuators supplied with the valve may require maintenance per the actuator manufacturer's recommendations. For valves supplied with gears, the grease in the gearbox might need to be cleaned out and replaced periodically. Use only high temperature grease recommended for gearboxes.
3. Metal-seated ball valves have high torques. Consult your Emerson Process Management sales office for more information.
4. Valves operate clockwise to close and counterclockwise to open. Gears and actuators are marked with arrows and symbols to show valve position and operating direction. Lever operated valves have an integral lockplate so that only the correct operating direction is possible. The lockplate has the “O” for open and the “C” for closed marked to show proper position. The lever is always aligned with the ball bore for positive proof of ball position. Gears and actuators have adjustable stops for proper ball positioning.
5. The ball is mate lapped to the end adapter seat. The top of the stem is marked to show the proper orientation of the lapped side of the ball.
6. This valve should be either normally open or normally closed. Throttling with this valve is not recommended for extended periods. Throttling for brief periods during startup or shutdown is allowed.

# Maintenance

Valve parts are subject to normal wear and must be inspected and replaced as necessary. The frequency of inspection and replacement depends upon the severity of service conditions.

**⚠ WARNING**

**Avoid personal injury from sudden release of process pressure. Before performing any maintenance operations:**

- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **The valve packing area may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline*. Process fluids may spray out under pressure when removing the packing hardware or packing rings.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

1. If valve maintenance is required, contact your Emerson Process Management sales office.

# Troubleshooting

## Operation

- **Stem adapter/actuator may be misaligned--** Remove actuator and stem adapter, then reassemble per assembly procedures for actuators.
- **Over-tightened stem packing--** Loosen packing to hand tight, cycle valve and retighten per procedures following torque table 5.
- **Inadequate air supply--** Increase air supply or install larger solenoid or quick exhaust valve. Refer to actuator manufacturer's specifications.

## Valve will not Rotate

- **Valve body ID or bore is clogged--** Flush or clean valve ID and try to cycle valve.
- **Actuator is not operating correctly or has failed--** Replace or repair actuator and try to cycle valve.
- **Stem keys have sheared--** Remove stem adapter and determine why keys sheared, insert new keys, reassemble and try to cycle valve.

## Valve Stem Packing Leaking

- **Packing flange bolting is loose--** Tighten packing bolting. See Packing Replacement section, step 7 on page 13 of this instruction manual.
- **Packing is damaged or improperly installed--** Depressurize valve, remove old packing and replace with new assembly per assembly instruction steps 3 to 5.
- **Actuator misalignment--** Check for actuator misalignment.

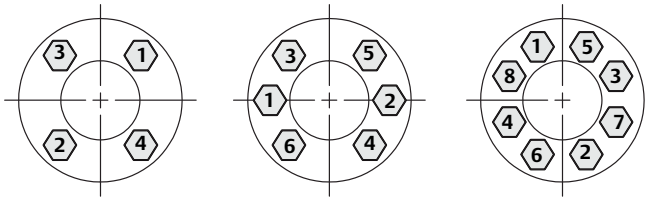
## Valve Body Gasket Leaking

- **Body bolting is loose--** Tighten body bolting per table 4 and figure 2.
- **Body gasket damaged--** Contact your Emerson Process Management sales office.

Table 4. Body Bolt Torque Values

| BOLT SIZE | | RECOMMENDED TORQUE | | |
|---|---|---|---|---|
| mm | Inch | lbf • ft | lbf • in | N • m |
| 13 | 1/2 | 20 | 240 | 27 |
| 16 | 5/8 | 40 | 480 | 54 |
| 19 | 3/4 | 65 | 780 | 88 |
| 22 | 7/8 | 110 | 1320 | 149 |
| 25 | 1 | 165 | 1980 | 224 |
| 29 | 1-1/8 | 240 | 2880 | 325 |
| 32 | 1-1/4 | 335 | 4020 | 454 |
| 35 | 1-3/8 | 450 | 5400 | 610 |
| 38 | 1-1/2 | 600 | 7200 | 814 |
| 41 | 1-5/8 | 725 | 8700 | 984 |
| 44 | 1-3/4 | 1000 | 12000 | 1356 |

Figure 2. Bolting Tightening Pattern




## Valve Leaking through Ball or Seating Area

- Valve body ID or bore is clogged-- Flush or clean valve ID and try to cycle valve.
- Valve is not fully closed-- Close valve, taking care not to over torque.
- Actuator travel stops are not set correctly-- Set stops and cycle, checking for leaks.
- Seat or Ball is damaged-- Contact your Emerson Process Management sales office for repair.
- Belleville spring is collapsed — Contact your Emerson Process Management sales office for repair.

**Note**

If you need additional trouble-shooting assistance, please contact your Emerson Process Management sales office.

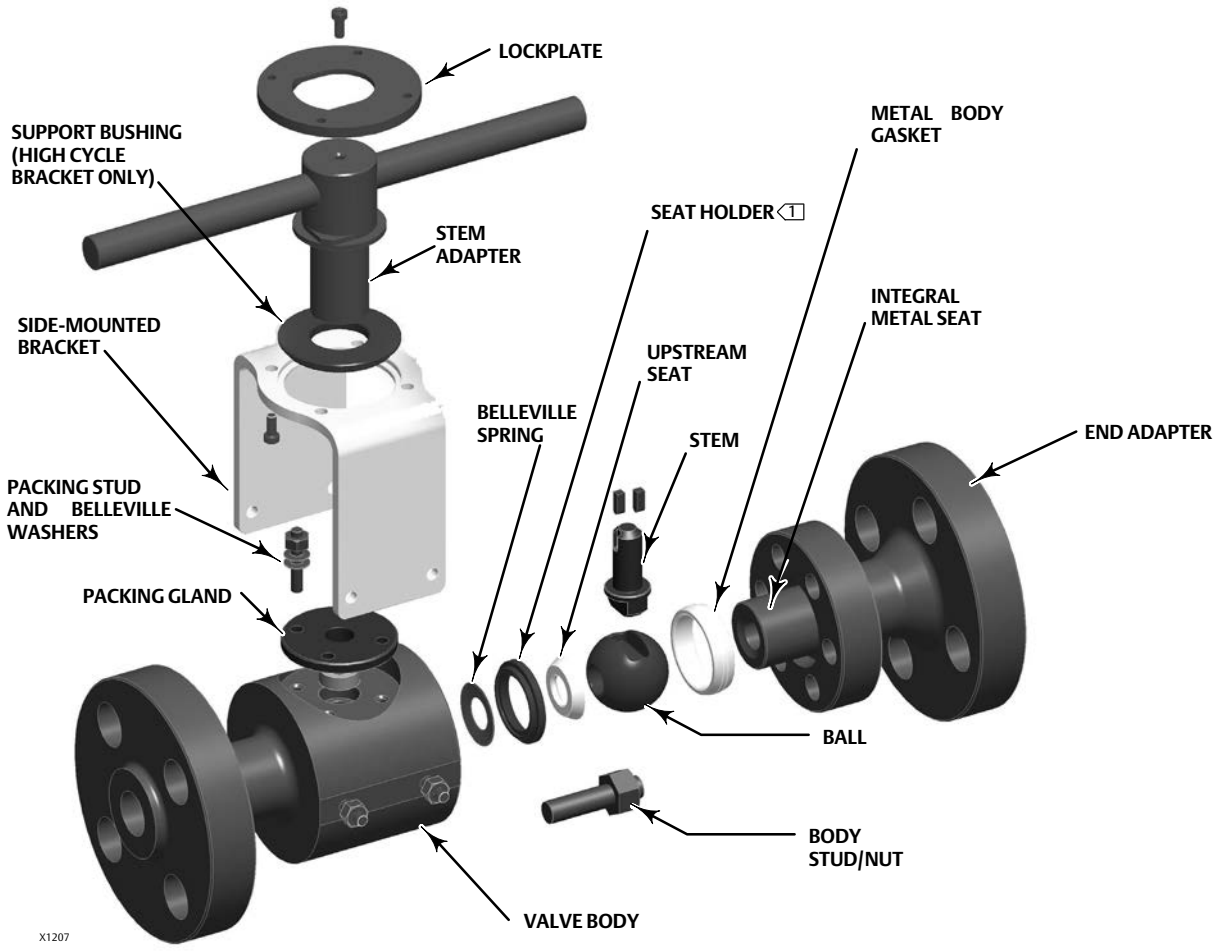
# Packing Replacement

**⚠ WARNING**

**Avoid personal injury from sudden release of process pressure. Before performing any maintenance operations:**

- **Do not remove the actuator from the valve while the valve is still pressurized.**
- **Disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.**
- **Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of the valve. Drain the process media from both sides of the valve.**
- **Vent the power actuator loading pressure and relieve any actuator spring precompression.**
- **Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.**
- **Always wear protective gloves, clothing, and eyewear when performing any maintenance operations.**
- **The valve packing area may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline*. Process fluids may spray out under pressure when removing the packing hardware or packing rings.**
- **Check with your process or safety engineer for any additional measures that must be taken to protect against process media.**

Figure 3. Sectional View




Note:
1 Seat holder is standard on welded and threaded end connections in 0.65, 1.15, and 1.5 inch bores only. Bidirectional option must be specified for all other constructions.

1. Loosen the packing studs.
2. Remove the packing rings from the packing box, being careful not to damage the packing box.
3. Inspect the clean packing box to ensure all surfaces are clean and undamaged.
4. Insert the zero clearance washer. Us the packing flange to press the washer into position.
5. Insert the bottom end ring of the stem packing. Use the packing flange to press the bottom end ring into position.
6. Insert the die formed rings. Use the packing flange to press the ring into position.

Figure 4. Assembly Steps

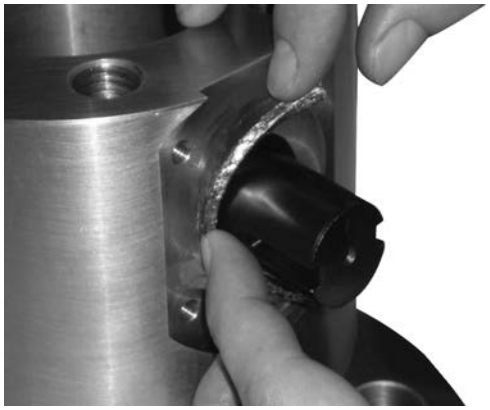
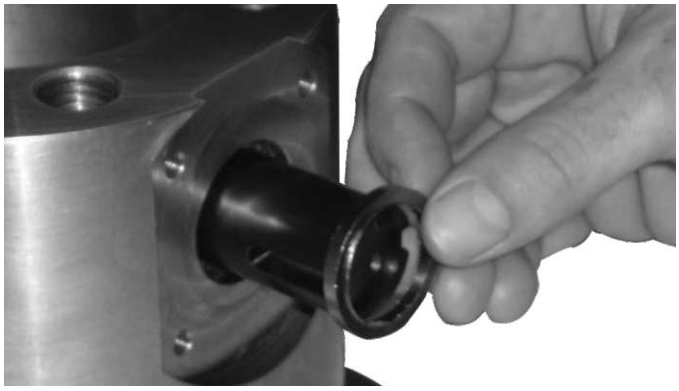


Figure 5. Insert Top End Ring



7. Insert the top end ring of stem packing. Use the packing flange to press the top end ring into position.

Figure 6. Use Packing Flange

8. Bolt up the packing flange. Use Belleville washers in the same orientation as removed. Contact your Emerson Process Management sales office for additional information. Make sure that the markings on the studs and nuts are facing out. Tighten the nuts in a star pattern (figure 2). Tighten the nuts with applicable torque (table 5).

Figure 7. Bolt Up the Packing Flange

# Actuator Mounting

## CAUTION

**Never use a hammer or excessive force to install the stem adapter on the valve. Improper installation can cause permanent damage to the valve.**

1. Mount the stem adapter on top of the stem with the two keys. Make sure it fits onto the stem easily without hammering.
2. Position the mounting bracket onto the body. Use anti-seize lubricant on the bracket studs and nuts. Make sure the markings on the studs and nuts are facing out. Leave the nuts.

Figure 8. Mount the Stem Adapter

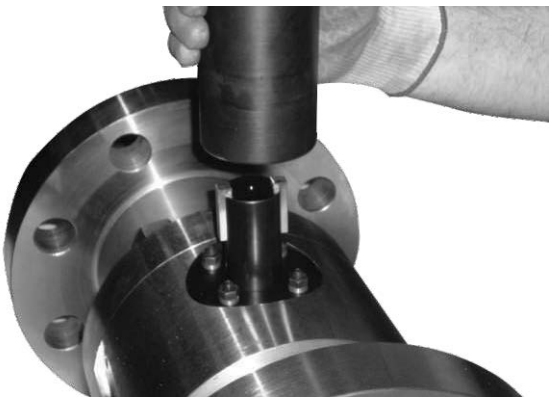
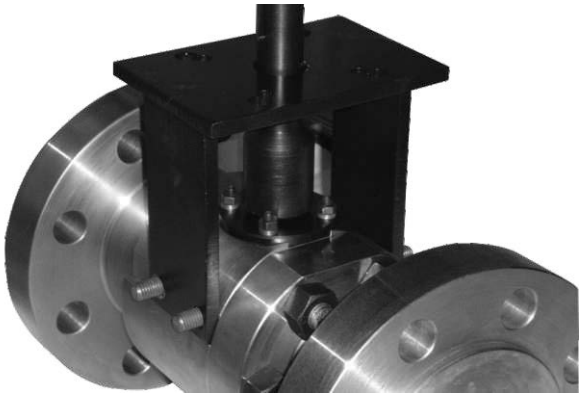


Figure 9. Position the Mounting Bracket



3. Place the actuator on top of the mounting bracket and stem adapter, in the fail position. Make sure the actuator is properly aligned with the stem adapter. If not, loosen the mounting bracket to assure proper alignment and retighten the mounting bracket. Use anti-seize lubricant on the actuator studs and nuts. Ensure the markings on the studs and nuts are facing out. Ensure the mounting can allow or can accommodate expansion of the stem or adapter at high temperature. Reference table 6.
4. Tighten the actuator and mounting bracket studs to the applicable torque after everything is aligned properly.
5. Install the actuator hand wheel, if present, with key and retention plate. Install the indicator plate on top of the actuator.

Figure 10. Place the Actuator on Top of the Mounting Bracket

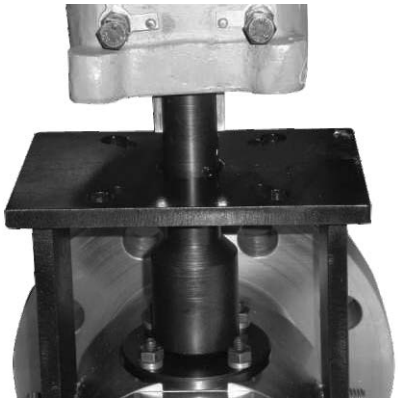
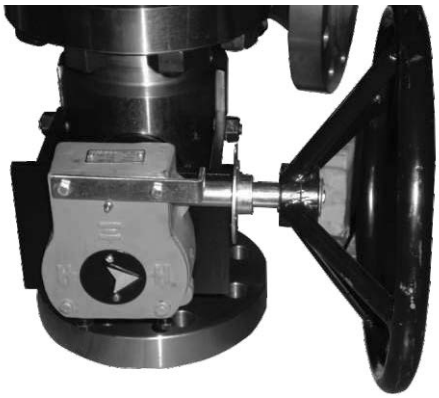


Figure 11. Install the Handwheel



## Hand Lever

6. Position the mounting bracket onto the body. Use anti-seize lubricant on the bracket studs and nuts. Make sure the markings on the studs and nuts are facing out. Leave the nuts finger tight.
7. Insert the support bushing into the allotted slot of the mounting bracket.
8. Mount the stem adapter on top of the stem with the two keys. Make sure it fits onto the stem easily without hammering. Make sure the mark is facing the lapped side of the ball/end adapter.

Figure 12. Stem Adapter

9. Place the lock plate on top of the mounting bracket. Note the orientation of the open “O” and closed “C” markings.

Figure 13. Lock Plate

10. Thread on the socket head cap screws, using anti-seize lubricant, from the underside of the mounting bracket.
11. Tighten the mounting bracket and lockplate bolting to the applicable torque after everything is aligned properly.

Figure 14. Handlever Assembly

12. Insert the lever through the hole on the stem adapter. Thread in the set screw on top of the stem adapter to hold the lever in place.

Table 5. Packing Flange Bolt Torque Values

| BOLT SIZE | | RECOMMENDED TORQUE | | |
|---|---|---|---|---|
| mm | Inch | lbf • ft | lbf • in | N • m |
| 6 | 1/4 | 4 | 50 | 6 |
| 8 | 5/16 | 6 | 75 | 8 |
| 10 | 3/8 | 8 | 100 | 11 |
| 11 | 7/16 | 15 | 180 | 20 |
| 13 | 1/2 | 21 | 250 | 28 |
| 16 | 5/8 | 38 | 450 | 50 |
| 19 | 3/4 | 58 | 700 | 79 |
| 22 | 7/8 | 100 | 1200 | 135 |
| 25 | 1 | 150 | 1800 | 203 |

Table 6. Assembly Stand Off

| NOMINAL BALL SIZE(1) | | STANDOFF MINIMUM | | STANDOFF MAXIMUM | |
|---|---|---|---|---|---|
| mm | Inch | mm | Inch | mm | Inch |
| 13 | 1/2 | 0.69 | 0.027 | 0.89 | 0.035 |
| 19 | 3/4 | 0.64 | 0.025 | 1.02 | 0.040 |
| 25 | 1 | 0.71 | 0.028 | 1.14 | 0.045 |
| 38 | 1-1/2 | 0.89 | 0.035 | 1.27 | 0.050 |
| 51 | 2 | 0.81 | 0.032 | 1.55 | 0.061 |
| 64 | 2-1/2 | 0.98 | 0.039 | 1.83 | 0.072 |
| 76 | 3 | 1.02 | 0.040 | 1.27 | 0.050 |
| 102 | 4 | 0.91 | 0.036 | 1.75 | 0.069 |
| 127 | 5 | 0.97 | 0.038 | 1.88 | 0.074 |
| 152 | 6 | 0.94 | 0.037 | 1.65 | 0.065 |

1. Contact your Emerson Process Management sales office for additional sizes.

# Parts Ordering

A serial number is assigned to each valve and stamped on the nameplate. Always refer to the valve serial number when corresponding with your Emerson Process Management sales office regarding spare parts or technical information.

**⚠ WARNING**

**Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Process Management should not, under any circumstances, be used in any Fisher valve, because they will void your warranty, might adversely affect the performance of the valve, and could give rise to personal injury and property damage.**

# Parts List

**Note**

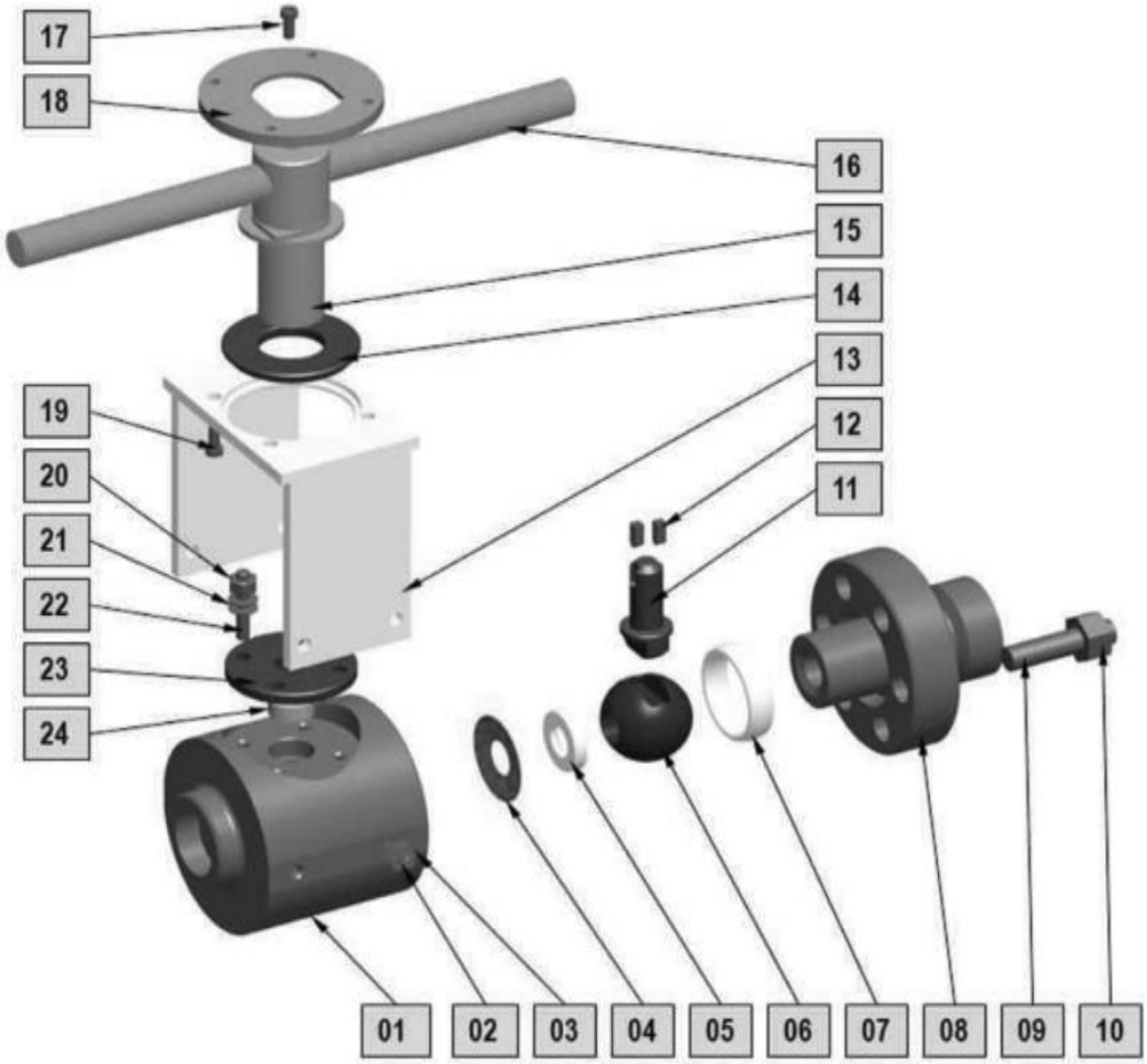
Contact your Emerson Process Management sales office for part number information.

| Key | Description |
|---|---|
| 1 | If you need a valve body as a replacement part, order by valve size, serial number, and desired valve body material. Contact your Emerson Process Management sales office for assistance. |
| 2 | Mounting Bolts |
| 3 | Mounting Nuts |
| 4 | Belleville Spring |
| 5 | Upstream Seat / Guide |
| 6 | Ball |
| 7 | Valve Body Gasket |
| 8 | End Adapter |
| 9 | Body Bolts |
| 10 | Body Nuts |
| 11 | Stem |
| 12 | Stem Key |
| 13 | Mounting Bracket |
| 14 | Support Bushing |
| 15 | Stem Adapter |
| 16 | Handle Lever |
| 17 | Lever Cap Screw |
| 18 | Lock Plate |
| 19 | Plate Cap Screw |
| 20 | Packing Nuts |
| 21 | Belleville Washer |
| 22 | Packing Bolts |
| 23 | Packing Gland |
| 24* | Stem Packing |
| | Seat Holder for Bidirectional Shutoff (not shown) |



*Recommended spare parts

Figure 15. Fisher Z500 Valve Assembly



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